



FACT SHEET

NPDES Permit Number: AK-003865-2
Date: Feb. 2, 2006
Public Notice Expiration Date: March 6, 2006
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The U.S. Environmental Protection Agency (EPA) Plans To Re-issue A Wastewater Discharge Permit To:

**Teck Cominco Alaska, Inc.
Red Dog Mine**

**near
Kotzebue, Alaska**

and the State of Alaska proposes to Certify the Permit

EPA Proposes NPDES Permit Issuance.

EPA proposes to re-issue a *National Pollutant Discharge Elimination System* (NPDES) permit to Teck Cominco's Red Dog Mine. The draft permit sets conditions on the discharges of pollutants from the mine to the Middle Fork of Red Dog Creek, tundra wetlands and various receiving waters as described for storm water outfalls. In order to ensure protection of water quality and human health, the permit places limits on the types and amounts of pollutants that can be discharged.

This Fact Sheet includes:

- information on public comment, public hearing, and appeal procedures
- a description of the current discharge
- a description of the discharge locations and a map, and
- technical material supporting the conditions in the permit

Alaska State Certification.

EPA requests that the Alaska Department of Environmental Conservation (ADEC) certify the NPDES permit for Red Dog Mine under section 401 of the Clean Water Act. EPA may not issue the NPDES permit until the state has granted, denied, or waived certification. The state of Alaska has provided a draft certification for the permit (See Appendix B). For more information concerning this review, please contact Luke Boles at (907) 451-2142 or 610 University Avenue, Fairbanks, Alaska 99709 or Luke_Boles@dec.state.ak.us

Alaska Coastal Management Program

In a letter dated June 16, 2005, the Alaska Department of Natural Resources, Office of Program Management and Permitting (OPMP), Alaska Coastal Management Program (ACMP) stated that the reissuance of the Red Dog Mine NPDES permit does not require further review for consistency with the ACMP.

National Environmental Policy Act (NEPA)

In compliance with EPA headquarter guidance for re-issued NPDES permits, the EPA Region 10 NEPA Compliance Program has evaluated the proposed changes to the NPDES permit and prepared an Environmental Assessment and a Finding of No Significant Impact (FONSI) for this permit reissuance.

Public Comment

EPA will consider all comments before issuing the final permit. Those wishing to comment on the draft permit or FONSI may do so in writing by the expiration date of the Public Notice. All comments should include name, address, phone number, a concise statement of basis of comment and relevant facts upon which it is based. All written comments should be addressed to the Office of Water & Watersheds Director at U.S. EPA, Region 10, 1200 Sixth Avenue, OW-130, Seattle, WA 98101; submitted by facsimile to (206) 553-0165; or comments on the draft permit may be submitted via e-mail to godsey.cindi@epa.gov and comments on the FONSI may be submitted via e-mail to shaw.hanh@epa.gov

After the Public Notice expires and all significant comments have been considered, EPA's regional Director for the Office of Water & Watersheds will make a final decision regarding permit re-issuance. If no comments requesting a change in the draft permit are received, the tentative conditions in the draft permit will become final, and the permit will become effective upon issuance. If significant comments are received, EPA will address the comments and issue the permit along with a response to comments. The permit will become effective 30 days after the issuance date, unless the permit is appealed to the Environmental Appeals Board (EAB) within 30 days.

Persons wishing to comment on State Certification should submit written comments by the public notice expiration date to the Alaska Department of Environmental Conservation c/o Luke Boles, 610 University Avenue, Fairbanks, Alaska 99709 or Luke_Boles@dec.state.ak.us

Documents are Available for Review.

The draft NPDES permit and related documents can be reviewed or obtained by visiting or contacting EPA's Regional Office in Seattle between 8:30 a.m. and 4:00 p.m., Monday through Friday (See address below). Draft permits, Fact Sheets, and other information can also be found by visiting the Region 10 website at www.epa.gov/r10earth/water.htm

United States Environmental Protection Agency
Region 10
1200 Sixth Avenue, OW-130
Seattle, Washington 98101
(206) 553-0523 or
1-800-424-4372 (within Alaska, Idaho, Oregon and Washington)

The fact sheet and draft permit are also available at:

EPA Alaska Operations Office
222 W. 7th Avenue #19
Anchorage, Alaska 99513-7588
(800) 781-0983 toll free in Alaska only

Alaska Department of Environmental Conservation
610 University Avenue
Fairbanks, Alaska 99709

For technical questions regarding the permit or fact sheet, contact Cindi Godsey at (907) 271-6561 or godsey.cindi@epa.gov. Services can be made available to persons with disabilities by contacting Audrey Washington at (206) 553-0523.

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TECHNICAL INFORMATION

I. APPLICANT

Teck Cominco Alaska, Inc.
Red Dog Operations
3105 Lakeshore Dr. Bldg A Suite 101
Anchorage, AK 99507

Facility Contact: Mark Thompson (907) 426-9145
Facility Location: foothills of the DeLong Mountains near Kotzebue, Alaska

II. FACILITY ACTIVITY

Teck Cominco Alaska Incorporated (TCAK), in partnership with the NANA Regional Corporation, operates the Red Dog zinc/lead mine in the Northwest Arctic Borough (NWAB) of Alaska, 90 miles north of Kotzebue and 47 miles inland from the coast of the Chukchi Sea. The mine site is located on a ridge between the Middle and South Forks of Red Dog Creek, in the DeLong Mountains of the Western Brooks Range. Red Dog is the world's largest zinc mine. NANA Management Services, Inc. provides camp management, housekeeping, catering and other services; and NANA/Lynden LLC, operates trucks carrying mineral concentrates from the mine to the Alaska Industrial Development and Export Authority's (AIDEA's) DeLong Mountain Transportation System port facility.

The Red Dog deposit consists of metal sulfides in a Mississippian shale. The orebody lies within the drainage basin of the Middle Fork of Red Dog Creek. Facilities at the mine site include an open pit zinc/lead mine, concentrator, tailings impoundment, concentrate storage building, maintenance facilities, power generation plant and an accommodations complex. The open pit mine is established on both sides of the valley of the Middle Fork of Red Dog Creek.

Mine production at Red Dog Mine involves the stripping and stockpiling of ore, waste (i.e., rock with sub-economic value), and overburden/topsoil. Mill production involves crushing, grinding and processing to produce mineral concentrates. Based on the current economic pit design, the Red Dog Mine main pit is expected to remain in production until 2012. The current five-year forecast shows an ore production rate of 3.5 million tonnes per year. Mining is done by open-pit methods and averaged 8,900 ore tonnes per day in 2002. The mill requires a consistent feed of homogeneous ore material to optimize recovery. To accommodate this requirement, layered stockpiles, typically holding 280,000 tonnes, are built to combine the various types and grades of ore.

The mill is located on a graded pad adjacent to, and northeast of, the tailings dam. The operation includes two crushing plants and grinding, flotation, reagent and dewatering facilities. Stockpiled ore is rehandled to a gyratory crusher where it is reduced to a size of less than six inches in one pass. The crusher product is conveyed to an enclosed, coarse ore stockpile. The building is capable of holding about 15,000 tonnes of mill feed in one large pile. Coarse ore is withdrawn from underneath the stockpile to feed

three Semi-Autogenous Grinding (SAG) mills. The grinding circuit overflow is delivered to the prefloatation circuit. Froth flotation processes separate materials into floating (particles attached to bubbles) and sinking components, which produce concentrate and tailings, respectively.

Final lead and zinc concentrates are thickened and dewatered to a final cake. These filtered concentrates are stored in the mill site concentrate storage building. From there, the concentrate is transferred by truck to the port site for shipment.

The concentrator tailings are pumped from the mill to the tailings facility and deposited either sub-aqueously or sub-aerially. The facility includes a rock fill dam and impoundment, a seepage collection and pumping system, a tailings discharge system (pumps and pipeline), and a water reclamation system.

The current dam crest is at elevation 950 ft. The pond elevation is at 947 ft elevation. Upstream (south) from the dam the impoundment is 8,000 ft long and 2,600 ft wide at its widest point. It is bounded on the south end by the Overburden Stockpile built on the divide between the South Fork of Red Dog Creek and Bon's Creek. The impoundment has an ultimate capacity of approximately 39.3 million cubic yards (cy) of tailings, assuming that the tailings remain covered by water.

III. BACKGROUND

In the early 1980s, TCAK submitted several applications for federal authorizations for the project. The surface water discharge was a new source which required EPA to prepare an Environmental Impact Statement (EIS) under the National Environmental Policy Act (NEPA). The EIS was issued in 1984 and the first NPDES permit was issued in 1985 and expired in 1990. The permit was reissued in 1998, modified in 2003, and expired in 2003. TCAK re-applied for the reissuance of their NPDES permit in a timely manner so the permit has been administratively extended until it is reissued.

The 2003 modification of the permit was appealed and the TDS limits during grayling spawning were stayed. The Fact Sheet addresses the grayling spawning TDS limits that were included in the modification as well as the site specific criteria for TDS that has been proposed by ADEC.

IV. RECEIVING WATERS

- A. Outfall Location. The facility proposes to discharge to the Middle Fork Red Dog Creek through outfall 001. Outfall 001, the discharge point for treated mine drainage and excess precipitation, is located at latitude 68° 04' 17" N, and longitude 162° 52' 05" W. Outfall 002, the discharge point for treated domestic wastewater, is located at latitude 68° 01' 45" N, and longitude 162° 54' 56" W. Stormwater is also discharged through outfalls in the facility vicinity; and the outfall locations are defined in the Stormwater Pollution Prevention Plan (SWPPP).
- B. Water Quality Standards. The Alaska State Water Quality Standards (WQS) include use classifications, numeric and/or narrative water quality criteria, and the antidegradation policy. The use classification system designates the beneficial

uses that each water body is expected to achieve (such as contact recreation, growth and propagation of fish, etc.). The criteria for each parameter are the criteria deemed necessary by the State to support the beneficial use classification of each water body.

The Middle Fork Red Dog Creek is protected in the WQS [18 AAC 70.230(e)(19)] for freshwater Class (1)(A)(iv) for industrial water supply use from the headwaters to the terminus of the Red Dog Mine Water Management System. Lower Middle Fork Red Dog Creek from the terminus of the Red Dog Mine Water Management System to the confluence with North Fork Red Dog Creek is protected in the WQS [18 AAC 70.230(e)(20)] for freshwater Classes (1)(A)(iv), (1)(B)(i) contact recreation, wading only and (1)(B)(ii) for secondary recreation (except fishing). The main stem of Red Dog Creek from the confluence of the Middle and North Forks to Ikalukrok Creek is protected in the WQS [18 AAC 70.230(e)(18)] for freshwater Classes (1)(A)(iv), (1)(B)(i) contact recreation, wading only, (1)(B)(ii) for secondary recreation, and (1)(C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife. Ikalukrok Creek from its confluence with Red Dog Creek to the Wulik River is protected in the WQS [18 AAC 70.230(e)(8)] for freshwater Classes (1)(A)(iv), (1)(B)(i) contact recreation, wading only, (1)(B)(ii) for secondary recreation, and (1)(C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife.

The water quality parameters that could be affected by the discharge from the facility include metals, solids and pH. These are common potential water quality parameters of concern in treated mine water discharges.

ADEC has proposed a site-specific criterion (SSC) for Total Dissolved Solids (TDS) that would result in effluent limitations different from those that would be required in the permit under the current WQS. The proposed change was adopted by the state of Alaska and if approved by EPA prior to finalizing the permit, the SSC would be used.

ADEC has proposed, in its 401 Certification, an SSC for cadmium which is based on the natural condition. The State may implement this type of SSC in a 401 Certification according to 18 AAC 70.235(a)(1), without a State regulatory change. EPA approval of the SSC is necessary prior to its use in an NPDES permit.

V. DESCRIPTION OF DISCHARGE

The tailings pond at the Red Dog Mine receives water from a variety of sources. These sources potentially include: water associated with the tailings from the milling process which include small amounts of the reagents used in the process; domestic wastewater, assay laboratory, filter press discharge, thickener overflows, and heavy equipment washing water carried by the gravity line from the mill/housing area; truck wash water; waste dump seepage; overburden pumpback; CSB air scrubber (if installed); SCR wastewater; natural gas produced water; filter clothes which are buried with the tailings; soil cement used on the exposed tailings beach; seepage pumpback; blasting agents; secondary containment water; snow dump; mine sump water; sand filter backwash and sand deposited on the tailings beach; and Port wastewaters hauled

to the mine site such as regeneration solution from the ion exchange treatment process at the Port. These contributions to the Tailings Impoundment are described in the re-application package.

Tailings pond water, often called reclaim water, is pumped by floating barge pumps in the tailings pond to two different water treatment plants at the mill facility. Water treatment plant 1 (WTP-1) operates year round at a nominal rate of 6,000 gallons per minute (gpm) and provides the mill with treated process water. Water treatment plant 2 (WTP-2) is seasonally operated and treats reclaim water for discharge at Outfall 001 at a maximum capacity of 14,500 gpm. WTP-2 also has the ability to provide process water to the mill when excess treated water is available.

At WTP-2, reclaim water is first treated in the pipeline with at least 6 mg/L of sodium sulfide and mixed in an in-line mixer. The sulfide reacts with the dissolved cadmium in the reclaim water to form insoluble cadmium sulfide, which is stable throughout the remainder of the treatment process. Reclaim water then flows into a 6,500 cubic-foot (cuft) rapid mix tank where reacted lime and recycled solids are added to adjust the pH to approximately 10.3. From the rapid mix tank the solution gravity flows into a 50,000 cuft lime reactor that provides a nominal 20 minute residence time for complete chemical reactions. Large amounts of compressed air are sparged in to the rapid mix tank to ensure full oxidation of all ions in solution.

The significant chemical reaction occurring in the lime reactor is the precipitation, altering the form of an ion from a dissolved state to a solid state, of soluble metals as insoluble metal-hydroxides. The precipitated solids are maintained in suspension and flocculent is added, coalescing the smaller particles into larger solids. The flocculent is allowed to react in agitated floc mix tank. From the floc mix tank, the solution gravity flows into a 200 foot diameter circular clarifier where the solids are allowed to settle under gravity and separate from the water. Settled solids are removed through the "underflow" and the treated water leaves the clarifier through the "overflow". The majority of the underflow solids are recycled back to the beginning of the treatment process to a 1,200 cuft lime/sludge mix tank where the solids are mixed with lime (calcium hydroxide). Product in the lime/sludge mix tank is then fed into the rapid mix tank with the raw reclaim water.

Clarifier overflow water then gravity flows to three sandfilters operated in parallel. The sand filters remove any residual solids not settled out of solution in the clarifier. From the sand filters, automated pH and turbidity meters take final measurements. If the pH is within permit limits and a range established which ensures effective treatment and the turbidity is within an established range which indicates that effective suspended solids removal has been accomplished, the water is discharged to Red Dog Creek. If the pH and turbidity are not within the narrowly prescribed range, the filtered water is discharged back into the tailings impoundment.

VI. PERMIT REQUIREMENTS

A. Applicable Laws and Regulations

In general, the Clean Water Act requires that the effluent limits for a particular pollutant be the more stringent of either technology-based effluent limits or water quality-based limits. A technology-based effluent limit requires a minimum level of treatment for industrial point sources based on currently available treatment technologies. A water quality-based effluent limit is designed to ensure that the water quality standards of a waterbody are being met. For more information on deriving water quality-based effluent limits, see Appendix C.

B. Effluent Limitations

1. Wastewater from Outfall 001

An evaluation for the discharge from Outfall 001 was done comparing the technology-based limitations in 40 CFR Part 440 Subpart J, plus other parameters of concern, with the WQ-based limitations discussed in Appendix C. For most parameters, the WQ-based limitation is more restrictive.

- a. The following summarizes the effluent limitations that are in the draft permit:

TABLE 1 – Effluent Limitations and Monitoring Requirements for Outfall 001					
Parameter (in ug/L unless otherwise Noted)	Daily Maximum	Monthly Average	Weekly Average	Sample Frequency	Sample Type ¹
Cadmium ²	0.94	0.44	---	1/week	24 hour composite
Cadmium ² (proposed)	3.4	2.0	---	1/week	24 hour composite
Calcium, mg/L	---	---	---	1/week	24 hour composite
Copper ²	34.40	17.15	---	1/week	24 hour composite
Chromium ²	---	---	---	1/week	24 hour composite
Lead ²	17.53	8.78	---	1/month	24 hour composite
Magnesium, mg/L	---	---	---	1/week	24 hour composite
Manganese ²	---	---	---	1/week	24 hour composite
Mercury, total	0.02	0.01	---	1/month	24 hour composite
Selenium ²	7.80	4.23	---	1/week	24 hour composite
Zinc ²	386.32	237.11	---	1/week	24 hour composite
Total Suspended Solids (TSS), mg/L	30.0	20.0	---	1/week	24 hour composite
Total Dissolved Solids (TDS), mg/L	See Permit Part I.A.8.			1/week	24 hour composite
Cyanide, WAD	---	---	---	1/week	Grab
Fecal Coliform, #/100 ml	---	200	400	1/ 2 months	Grab

TABLE 1 – Effluent Limitations and Monitoring Requirements for Outfall 001

Parameter (in ug/L unless otherwise Noted)	Daily Maximum	Monthly Average	Weekly Average	Sample Frequency	Sample Type ¹
Aluminum ²	159.35	55.20	---	1/month	24 hour composite
Iron ² , µg/L	---	---	---	1/month	24 hour composite
Total Residual Chlorine, mg/L	---	---	---	1/month	Grab
Biochemical Oxygen Demand, mg/L	---	---	---	1/month	24 hour composite
Total Ammonia as N, mg/L	10.64	6.80	---	1/week	24 hour composite
Organic Priority Pollutant Scan ³ , µg/L	---	---	---	see note 3	24 hour composite
Turbidity, NTU	---	---	---	1/week	Grab
Temperature, °C	---	---	---	Daily	Grab
Cumulative Volume, gallons	See Permit Part I.A.3.		---	Continuous	Recording
Whole Effluent Toxicity, TUC	12.2	9.7	---	1/month	See Permit Part I.H.
pH, standard units	6.5 to 10.5			1/week	Grab
1. Effluent samples collected shall be representative of the effluent discharged without dilution from or contact with any outside sources. Results of analyses conducted under Part I.A.1. of this permit shall be submitted monthly on the discharge monitoring report.					
2. All metals shall be analyzed as total recoverable unless otherwise indicated.					
3. Volatile organics shall be monitored using EPA analytical method 624, semi-volatile organics shall be monitored using EPA analytical method 625. Testing shall be conducted once in May, July, and September.					

2. Whole Effluent Toxicity (WET) Requirements

Chronic WET testing is included in the draft permit on a monthly basis. The testing will occur at Outfall 001 so that the full effects of the discharge into the Middle Fork Red Dog Creek will be determined.

3. Outfall 002

This outfall is for the discharge from the construction camp of domestic wastewater as defined in 18 AAC 72.990(23) as "waterborne human wastes or graywater derived from dwellings, commercial buildings, institutions or similar structures." As such, the appropriate standards are the wastewater disposal standards found in 18 AAC 72.

- a. The following table summarizes the limitations that are in the draft permit for Outfall 002

TABLE 2						
Parameter ¹	7-Day Average	30-Day Average	Daily Maximum	Units	Sampling Frequency	Sample Type ²
Flow	---	---	---	Gpm	Continuous	Measurement

TABLE 2						
Parameter ¹	7-Day Average	30-Day Average	Daily Maximum	Units	Sampling Frequency	Sample Type ²
Biochemical Oxygen Demand (BOD ₅) Influent & effluent	45	30	60	mg/L	1/month	Composite
Biochemical Oxygen Demand (BOD ₅) Influent & effluent	---	---	---	lb/day	1/month	Composite
Total Suspended Solids (TSS) Influent & effluent	45	30	60	mg/L	1/month	Composite
Total Suspended Solids (TSS) Influent & effluent	---	---	---	lb/day	1/month	Composite
Fecal coliform	---	200	400	#/100 ml	1/month	Grab
Total Residual Chlorine ³	---	---	---	mg/L	1/month	Grab
Ammonia as N	---	---	---	mg/L	1/quarter	Grab
pH	See requirements below			s.u. ⁴	1/month	Grab

1 – For additional monitoring requirements see Permit Part I.B.5.
2 – Composite samples of effluent shall be composed of a mixture of four discrete grab samples of effluent. The grab samples shall be collected and combined within a 24 hour period. Each grab sample shall be collected and stored in accordance with procedures prescribed in Standard Methods, 18th, 19th or 20th Editions.
3 – TRC shall be analyzed immediately after sample collection using the DPD or amperometric method approved by EPA
4 – s.u. are standard units

- b. The permittee must not discharge any floating solids, visible foam in other than trace amounts, or oily wastes that produce a sheen on the surface of the receiving water.
- c. The pH must not be less than 6.5 standard units (s.u.) nor greater than 8.5 standard units (s.u.).
- e. Percent removal for BOD₅ and TSS must be reported monthly on the DMR. Percent removal requirements for BOD₅ and TSS are as follows: for any month, the monthly average effluent load shall not exceed 15 percent of the monthly average influent load. Loading shall be calculated using the following formula:

$$8.34 \times \text{pollutant concentration (mg/L)} \times \text{daily flow (mgd)}$$

- f. The permittee must collect effluent samples from the effluent stream after the last treatment unit prior to discharge into the receiving waters.
- g. Results of the sample analyses shall be submitted monthly with the discharge monitoring reports (DMRs)

4. Stormwater Outfalls

The discharge of pollutants to waters of the United States via stormwater is controlled in the Red Dog permit by the establishment of a Stormwater Pollution Prevention Plan (SWPPP). The basis for the SWPPP is described in Part VI.D. of this Fact Sheet and the requirements are found in Permit Part I.I.

5. Surface Water (Ambient) Monitoring

The following ambient monitoring shall be conducted:

The changes highlighted in this Table compare what is proposed to what was in the current permit.

TABLE 4 – Ambient Monitoring Requirements									
Parameter ¹	Station 2	Station 73 ²	Station 9 ²	Station 150	Station 40 ²	Station 12 ²	Station 20	Station 140 ²	Tributary ²
Aluminum	1/month	2/month	2/month	---	2/month	2/month	---	2/month	1/month
Cadmium	1/month	2/month	2/month	---	2/month	2/month	---	2/month	1/month
Chromium	1/month	2/month	2/month	---	2/month	2/month	---	2/month	1/month
Copper	1/month	2/month	2/month	---	2/month	2/month	---	2/month	1/month
Cyanide ³ , total, µg/L	1/month	2/month	---	---	2/month	---	---	---	---
Cyanide ⁴ , WAD, µg/L	---	---	---	---	2/month	---	2/month	---	---
Iron	1/month	2/month	2/month	---	2/month	2/month	---	2/month	1/month
Lead	1/month	2/month	2/month	---	2/month	2/month	---	2/month	---
Manganese	1/month	2/month	2/month	---	2/month	2/month	---	2/month	1/month
Nickel	1/month	2/month	2/month	---	2/month	2/month	---	2/month	1/month
Selenium	1/month	2/month	2/month	---	2/month	2/month	---	2/month	---
Silver	1/month	2/month	2/month	---	2/month	2/month	---	2/month	---
Zinc	1/month	2/month	2/month	---	2/month	2/month	---	2/month	1/month
Total ammonia as N, mg/L	1/month	2/month	2/month	---	2/month	2/month	---	2/month	---
Conductivity, µmhos/cm	1/month	2/month	2/month	---	2/month	2/month	---	2/month	---
Hardness, mg/L CaCO ₃	1/month	2/month	2/month	---	2/month	2/month	---	2/month	---
Temperature, °Celsius	1/month	2/month	2/month	---	2/month	2/month	---	2/month	---

TABLE 4 – Ambient Monitoring Requirements

Parameter ¹	Station 2	Station 73 160 ²	Station 9 ²	Station 150	Station 40 151 ²	Station 12 ²	Station 20	Station 140 ²	Tributary ²
Total Dissolved Solids (TDS), mg/L	1/month	1/week	2/month	1/week	1/week	2/month	---	2/month	---
TDS Anions and Cations ⁵	---	1/month	---	1/month	1/month	---	---	---	---
pH, standard units	1/month	2/month	2/month	---	2/month	2/month	---	2/month	---
Dissolved Oxygen ⁶ , mg/L	3/month	3/month	---	---	3/month	---	---	---	---
Hydrogen Sulfide ⁶ , mg/L	3/month	3/month	---	---	3/month	---	---	---	---
Turbidity, NTU	---	---	---	---	---	3/month	---	3/month	---
Whole Effluent Toxicity ⁶ , TU _c	---	---	1/month	---	---	1/month	---	---	---

1. Monitoring for metals shall be in ug/L and total recoverable unless otherwise noted. For additional monitoring requirements for aluminum, cadmium, chromium, copper, cyanide, iron, lead, manganese, mercury, nickel, selenium, silver, and zinc see section I.A.5.b.
2. The permittee shall spread out the sample collection dates so that the samples collected are representative of the calendar month. To the extent practicable, ambient monitoring shall coincide with effluent monitoring. If weather, safety, shipping, and other environmental constraints prevent the permittee from collecting representative samples, the permittee shall document the condition which prevented the representative samples from being collected on the discharge monitoring reports.
3. For additional monitoring requirements for cyanide, see Permit Part I.A.6.
4. The permittee shall notify the ADEC and the OHMP immediately by telephone should WAD cyanide concentrations exceed the detection limit of 3 ug/L.
5. This monitoring shall include a standard and complete suite of those cations and anions contributing to TDS including, but not limited to, carbonates, chlorides, sulfates, potassium, magnesium, calcium, and sodium. The carbonate analysis may be estimated based on direct measurement of alkalinity.
6. See Permit Part I.G. for additional testing requirements.

C. Monitoring Requirements

40 CFR 122.48(b) requires that the permit contain monitoring requirements. Self-monitoring of effluent parameters is necessary for the permittee to demonstrate compliance with effluent limitations, to assure that state water quality standards are met, and to provide information for future permitting actions. Monitoring frequencies are based on the Agency's determination of the minimum sampling frequency required to adequately monitor the facility's performance. Required sample types are based on the Agency's determination of the potential for effluent variability. These determinations take into consideration several factors, of which

the most important are the type of pollutants of concern and the type of treatment system. The Limitation Tables, above, include the monitoring frequency and sample type proposed in the draft permit.

D. Best Management Practices

Section 304(e) of the CWA requires EPA to include conditions in the NPDES permit that require the permittee to develop a Best Management Practices (BMP) Plan and/or a Stormwater Pollution Prevention Plan (SWPPP) to control potential discharges such as runoff, spillage, and leaks. This permit requires a Plan that combines general BMP Plan requirements with SWPPP requirements to control the discharge of toxics or hazardous pollutants by way of plant site runoff, spillage or leaks, sludge or waste disposal, and drainage from raw material storage. On a mine site, not all precipitation related drainage is considered stormwater for regulatory purposes. Drainage from the mine site is regulated as "mine drainage" rather than "storm water."

The intent of the SWPPP is to recognize the hazardous nature of various substances used and produced by the facility and the way such substances may be accidentally dispersed. The SWPPP should incorporate elements of pollution prevention as set forth in the Pollution Prevention Act of 1990, 42 U.S.C. 13101.

The SWPPP must be amended whenever there is a change in the facility or in the operation of the facility which materially increases the potential for an increased discharge of pollutants.

E. Quality Assurance Plan

The permit requires the permittee to develop and implement a Quality Assurance Plan. The purpose of the Quality Assurance Plan is to establish appropriate sampling, handling and analytical procedures for all effluent and ambient water samples taken.

F. Other Requirements or Changes from the current Permit

1. This permit prohibits the use of Untreated mine water for road watering, even inside the mine pit. This provision is included in the permit to prevent the transport of pollutants contained in the untreated wastewater to sites that are not sloped toward the tailings impoundment.
2. TCAK has indicated that they will not be discharging in the winter. This draft permit does not include any permit requirements that were related only to winter discharging (including Permit Parts I.C.11. and 12. and Notes 5 and 6 in the Table in Permit Part I.D.7. of the current permit)
3. TCAK has proposed to include some biomonitoring requirements in their Solid Waste permit, which will be developed by ADEC, and have requested that these requirements be removed from the NPDES permit. In the current permit, EPA included these requirements based on the State's CWA Section

1998 § 401 Certification. ADEC has proposed changes to the current biomonitoring program in its draft § 401 Certification for this draft permit. EPA is requesting comments on the changes which EPA has highlighted in the draft permit.

4. TCAK is also requesting a change in their ambient monitoring frequencies with the monitoring either being moved to the Solid Waste Permit or reduced. ADEC has proposed changes to the current ambient monitoring program in its draft § 401 Certification for this draft permit. EPA is requesting comments on the changes which EPA has highlighted in the draft permit.
5. TCAK has requested Alternative Test Procedures (ATPs) for WAD cyanide, chlorides and metals. The ATPs for chlorides and metals were approved during the cycle of the current permit and will be included in this permit. The ATP for WAD cyanide was approved by EPA in a letter dated November 16, 2005.
6. TCAK has requested that hardness be calculated rather than measured in the effluent. EPA has included monitoring in the draft permit to make this calculation possible.
7. Several parameters, including nickel and silver, monitored during the current permit cycle have shown no reasonable potential to violate the water quality criteria. The monitoring for these parameters has been removed from the permit.
8. TCAK has requested different method detection limits (MDLs). These are listed in the table below along with those MDLs included in the current permit:

Table 2 – Method Detection Limits		
Parameter ¹	MDL (ug/L)	Requested MDL ² (ug/L)
Aluminum	20	20
Cadmium	0.1	0.5
Chromium	1	2
Copper	1	5
Iron	30	40
Cyanide, WAD	3	3
Lead	0.08	1
Manganese	1	2
Mercury, total	0.2	0.005
Selenium	2	2
Zinc	2	5
Total Ammonia as N	10 ug/L	0.5 mg/L
BOD	8 mg/L	8 ug/L
TRC	10	0.1
¹ All metals shall be measured in total recoverable unless otherwise noted. ² The permittee may request less restrictive method detection limits for ambient monitoring. The request shall be submitted to EPA in writing, and is subject to EPA approval.		

All requested MDLs are below the effluent limitations for parameters that are limited in the draft permit. As such, there are no Minimum Levels designated as compliance levels in the draft permit.

G. Additional Permit Provisions

Sections II, III, and IV of the draft permit contain standard regulatory language that must be included in all NPDES permits. Because they are regulations, they cannot be challenged in the context of an NPDES permit action. The standard regulatory language covers requirements such as monitoring, recording, reporting requirements, compliance responsibilities, and other general requirements.

VII. **OTHER LEGAL REQUIREMENTS**

A. Endangered Species Act

Section 7 of the Endangered Species Act (ESA) requires federal agencies to request a consultation with the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) regarding potential effects an action may have on listed endangered species. EPA sent letters to the Services on August 23, 2005.

In a letter dated September 21, 2005, USFWS determined that the reissuance of the NPDES permit is not likely to adversely impact listed species so further consultation under Section 7 of the ESA is not necessary.

In a letter dated September 28, 2005, NMFS stated that there are no threatened or endangered species listed under their jurisdiction in the project area.

With the above information, EPA has determined that the re-issuance of this permit will have no effect on threatened or endangered species.

B. Essential Fish Habitat

Section 305(b) of the Magnuson-Stevens Act [16 USC 1855(b)] requires federal agencies to determine whether any activity proposed to be permitted, funded, or undertaken by a federal agency may have an adverse effect on designated Essential Fish Habitat (EFH) as defined by the Act. The EFH regulations define an adverse effect as any impact which reduces quality and/or quantity of EFH and may include direct (e.g. contamination or physical disruption), indirect (e.g. loss of prey, reduction in species' fecundity), site-specific, or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

EPA has determined that issuance of this permit is not likely to have an adverse effect on EFH in the vicinity of the discharge. Effluent limitations have been incorporated into the draft permit based on criteria considered to be protective of overall water quality in Red Dog Creek based on the designated uses of the creek. There is also a barrier to fish passage that prevents fish from coming into contact with the discharge. EPA will provide NMFS with this determination for their review.

and possible recommendations. Any recommendations received from NMFS regarding EFH will be considered prior to final issuance of this permit.

C. State Certification

Section 401 of the Clean Water Act requires EPA to seek state certification before issuing a final permit. As a result of the certification, the state may require more stringent permit conditions to ensure that the permit complies with WQS. The certification may also require additional monitoring requirements and authorize a mixing zone. A draft 401 Certification is included as Appendix B in this Fact Sheet.

D. Permit Expiration

This permit will expire five years from the effective date of the permit. Permits may be administratively extended under 40 CFR 122.6 if all the requirements of that regulation are met.

VIII. REFERENCES

Application package dated February 25, 2003.

EPA 1991. *Technical Support Document for Water Quality-based Toxics Control*. Office of Water Enforcement and Permits, Office of Water Regulations and Standards. Washington, DC., March 1991. EPA/505/2-90-001.

EPA 1999. *1999 Update of Ambient Water Quality Criteria for Ammonia*. Office of Water, Washington, D.C., December 1999. EPA-822-R-99-014.

Water Quality Criteria; Notice of Availability; 1999 Update of Ambient Water Quality Criteria for Ammonia. 64 Federal Register 71974 – 71980, December 22, 1999.

18 AAC 70, the Alaska Department of Environmental Conservation's Water Quality Standards.

18 AAC 72, the Alaska Department of Environmental Conservation's regulations for Wastewater Disposal.

18 AAC 80, the Alaska Department of Environmental Conservation's regulations for Drinking Water.

Proposed Revision to the TDS criterion for Red Dog Creek. Alaska Department of Environmental Conservation. Public Noticed September 26, 2005.

1998 Permit Package including the final permit, response to comments and 401 Certification.

2003 Permit Modification Package including the final permit, response to comments, fact sheet, Environmental Assessment, and 401 Certification.

Letter dated November 16, 2005, from William Riley, EPA, to R.G. Scott, TCAK, regarding Alternative Test Procedures (ATPs).

Letter dated June 16, 2005, from DNR/OPMP to TCAK regarding the ACMP review.

Letter dated December 10, 2005, from R.G. Scott, TCAK, to Luke Boles, ADEC, requesting that the SSC for zinc not be re-certified.

"WET Limit with Consideration to Updated Site-side Water Balance" submitted by TCAK to EPA on November 21, 2005.

EPA Water Quality Criteria for Water [63 FR 68354-68364, December 10, 1998].

APPENDIX A
Red Dog Mine Location

APPENDIX A
Red Dog Mine Location

APPENDIX B
DRAFT § 401 STATE CERTIFICATION

STATE OF ALASKA
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DRAFT CERTIFICATE OF REASONABLE ASSURANCE

A Certificate of Reasonable Assurance, as required by Section 401 of the Clean Water Act, has been requested by TeckCominco Alaska for NPDES Permit AK-003865-2 for the discharge of treated non-domestic wastewater, treated domestic wastewater and stormwater from the Red Dog Mine.

Public Notice of the application for this certification will be made in accordance with 18 AAC 15.140.

Water Quality Certification is required because the activity will be authorized by an Environmental Protection Agency permit identified as NPDES Permit AK-003865-2 and discharges will result from the activity.

This NPDES permit certification covers wastewater disposal from the following discharges:

1. Outfall 001 – Discharge of treated mine drainage and excess precipitation to the Middle Fork of Red Dog Creek. Outfall 001 is located at Latitude 68° 04' 17" N, Longitude 162° 52' 05" W.
2. Outfall 002 – Discharge of treated domestic wastewater to the tundra. Outfall 002 is located at Latitude 68° 01' 45" N, Longitude 162° 54' 56" W.
3. Discharge of snowmelt and rainfall runoff from the site as indicated in the Stormwater Pollution Prevention Plan.

Appendix A is hereby incorporated by reference as part of this Certification. Appendix A provides the Department's rationale for the establishment of a Natural Condition Based Site Specific Criterion (NCBSSC) as the applicable water quality criterion for cadmium in Main Stem Red Dog Creek and in Ikalukrok Creek. This action is taken under 18 AAC 70.235(b). The Department has reviewed the applicant's request for a NCBSSC and finds the prevailing highest quality natural condition cadmium concentration in Ikalukrok Creek to be a total concentration of 2 µg/L in Ikalukrok Creek. See Appendix A of this Certificate for a discussion on the cadmium NCBSSC.

The Department has reviewed TeckCominco Alaska's request to rescind the NCBSSC for zinc applied to Main Stem Red Dog Creek that was approved in the 401 certification issued for the 1998 NPDES permit. At the time of the certification the zinc NCBSSC was less stringent than the applicable zinc water quality criterion (WQC) at 18 AAC 70.020(b). Since the approval of the NCBSSC for zinc in the 1998 NPDES permit certification, the WQC for zinc has become less stringent, resulting in the NCBSSC being more stringent than the currently applicable WQC for zinc listed in 18 AAC 70.020(b)(11). The Department finds that the NCBSSC for zinc in the Main Stem Red Dog Creek is not required to protect existing uses of the waterbody and removal of the zinc NCBSSC is hereby approved. The applicable WQC for zinc in the Main Stem Red Dog Creek shall

be determined as required in 18 AAC 70.020(b) and the *Alaska Water Quality Criteria Manual*. These are the criteria the effluent limits in this NPDES permit should be based on. This finding has been reviewed with respect to the Antidegradation policy, specifically 18 AAC 70.015(a)(2), and found to be consistent with this policy.

The Department has reviewed the application with respect to the antidegradation policy of the Alaska Water Quality Standards and finds the reduction in water quality to be in compliance with the requirements of 18 AAC 70.015, provided that the terms and conditions of this certification are made part of the final NPDES Permit.

The Department has reviewed the discharges with respect to the Alaska Coastal Management Program (ACMP), as required under 11 AAC 110, and finds that there are no major modifications proposed from the previous ACMP consistency finding. This facility was previously found to be consistent with the ACMP during the previous NPDES Permit renewal. Therefore, pursuant to 11 AAC 110.820(k)(3) and (4), consistency review is not required for this permit reissuance.

Having reviewed the preliminary draft permit, the Alaska Department of Environmental Conservation certifies that there is reasonable assurance that the proposed activity, as well as any discharge that may result, is in compliance with the requirements of Section 401 of the Clean Water Act, which includes the Alaska Water Quality Standards (18 AAC 70). Through this certification, in accordance with 18 AAC 15.120 ADOPTION OF NPDES PERMITS, the final NPDES permit will constitute the permit required under AS 46.03.100 Waste Disposal Permit, provided that the terms and conditions of the final certification are made part of the final NPDES Permit. The department is specifying the following permit terms and conditions under authority of AS 46.03.110(d):

1. The ADEC authorizes the following mixing zones in this certification (NPDES Preliminary Draft Permit parts I.A.1 and I.A.8a):

A mixing zone in Main Stem Red Dog Creek of 1.5:1 (2.5x) dilution extending from the confluence of the Middle Fork Red Dog Creek with the North Fork Red Dog Creek to Station 151. The Main Stem Red Dog Creek mixing zone is approximately 1,930 feet in length. The mixing zone is granted for the following parameters: total dissolved solids (TDS), ammonia and WAD cyanide.

A mixing zone in Ikalukrok Creek of 1:1 (2x) dilution extending from the confluence of Main Stem Red Dog Creek and Ikalukrok Creek to Station 150. The mixing zone is approximately 3,420 feet in length. The Ikalukrok Creek mixing zone is granted for TDS.

Rationale: In accordance with State Regulations 18 AAC 70.240, the Department has authority to designate mixing zones in permits or certifications. The authorized mixing zones will ensure that the water quality standards are met at all points outside of the mixing zones.

The Department considered all aspects required in 18 AAC 70.015 (Antidegradation) and 18 AAC 70.240-270 (Mixing Zones) including, but not limited to, the potential risk to aquatic life based on existing monitoring data of effluent, and, Ikalukrok Creek and Main Stem Red Dog Creek water quality.

The Department finds that the sizes of the mixing zones authorized for discharge in this certification are appropriate and provide reasonable assurance that existing uses of Ikalukrok Creek and Main Stem Red Dog Creek outside of the mixing zones are maintained and fully protected.

2. The pH effluent limits for Outfall 001 are 6.0 to 10.5 pH units (NPDES Preliminary Draft Permit part I.A.2)

Rationale: The Department proposes to certify the same pH effluent limits as contained in the current NPDES Permit.

The most stringent Alaska Water Quality Standard regulation for pH protects Growth and Propagation of Fish, Shellfish, other Aquatic Life and Wildlife. It requires that pH "not be less than 6.5 or greater than 9.0 and not vary more than 0.5 pH unit from natural conditions."

An optimum pH, approximately 9.5 to 10.5 pH units, will precipitate metals from the effluent before it is discharged. Baseline pH at Station 30 (just above the present effluent discharge location) ranged from 5.8 to 6.7. Data collected at the discharge and in the receiving waters since mine operations began, indicate that pH stabilizes shortly after discharge into Red Dog Creek. pH is above 6.5 at Station 20 and is approximately 7 pH units at the mouth of Red Dog Creek; i.e., the mixing of basic discharge waters with acidic creek waters results in a slightly basic to neutral pH where fish occur. No mixing zone for pH is needed with the NPDES effluent limit range of 6.0 to 10.5 pH units.

3. Preliminary Draft Permit part I.A.8.b – the following language likely will not be necessary in the final Permit: "Prior to beginning discharge, the permittee shall consult with EPA, Alaska Department of Natural Resources, Office of Habitat Management and Permitting (OHMP), and Alaska Department of Environmental Conservation (ADEC), and the permittee must receive written approval from EPA."

Rationale: The regulation package adopting a Total Dissolved Solids Site Specific Criterion (SSC) under 18 AAC 70.235(c) was adopted by the State of Alaska and is expected to be approved by EPA prior to final Permit issuance. The proposed TDS SSC would allow TDS concentrations up to 1500 mg/L in Main Stem Red Dog Creek without timing restrictions. The Department finds that the notification and subsequent approval process will no longer be necessary to ensure that discharge will not affect aquatic life uses of the waterbody if the TDS SSC regulations are adopted as proposed.

4. Preliminary Draft Permit part I.A.8.c shall be updated as follows:

After the commencement of discharge, the permittee shall limit the TDS load discharged from Outfall 001 so as to maintain in-stream TDS concentrations at or below:

- (1) 1500 mg/L at the edge of the mixing zone in Main Stem Red Dog Creek,
- (2) 1000 mg/L at the edge of the mixing zone in Ikalukrok Creek throughout the discharge season, and
- (3) 500 mg/L from July 25th through the end of the discharge season at Station 160.

Rationale: The regulation package adopting a Total Dissolved Solids Site Specific Criterion under 18 AAC 70.235(c) was adopted by the State of Alaska and is expected to be approved by EPA prior to

final Permit issuance. The proposed TDS SSC would allow TDS concentrations up to 1500 mg/L in Main Stem Red Dog Creek without timing restrictions. The Department finds that the in-stream limits are required to ensure that existing uses are protected.

In 1999, the Department changed the water quality criterion under 18 AAC 70.020(b)(Note 12) for inorganic dissolved solids, regulated as TDS, to the following:

*Total Dissolved Solids (TDS) in concentrations up to 1000 mg/L in Ikalukrok Creek are in effect from the confluence of Ikalukrok Creek with Main Stem Red Dog Creek down to the Wulik River, **except** during chum salmon and/or Dolly Varden spawning in Ikalukrok Creek, when the aquatic life criterion of 500 mg/L will apply at Station 160.*

This criterion is in effect in the Ikalukrok Creek for the areas listed above.

In accordance with State Regulations 18 AAC 15.090, the Department may attach terms and conditions to a permit, variance, or approval, including operating, monitoring, inspection, sampling, access to records and reporting requirements, and the posting of a performance bond or other surety, that it considers necessary to ensure that all applicable criteria will be met.

5. The Department believes that Preliminary Draft Permit parts I.A.8.d and I.A.8.e will not be applicable and could be deleted in the final Permit.

Rationale: The regulation package adopting a Total Dissolved Solids Site Specific Criterion under 18 AAC 70.235(c) was adopted by the State of Alaska and is expected to be approved by EPA prior to final Permit issuance. The proposed TDS SSC would allow TDS concentrations up to 1500 mg/L in Main Stem Red Dog Creek without timing restrictions. The Department finds that the in-stream limits are required to ensure that existing uses are protected.

In accordance with State Regulations 18 AAC 15.090, the Department may attach terms and conditions to a permit, variance, or approval, including operating, monitoring, inspection, sampling, access to records and reporting requirements, and the posting of a performance bond or other surety, that it considers necessary to ensure that all applicable criteria will be met.

In accordance with Federal Regulation 40 CFR 124.53(e)(3) the Department shall include a statement of the extent to which each condition of the draft permit may be made less stringent without violating the requirements of State law. These statements are included above where it states that a change to the Preliminary Draft Permit "could" be made.

6. Preliminary Draft Permit part I.A.8.f(1) shall reference Station 151 as the downstream edge of the mixing zone in Main Stem Red Dog Creek. Station 150 shall be referenced as the downstream edge of the mixing zone in Ikalukrok Creek. Monitoring at Station 151 for TDS shall occur weekly. Monitoring for TDS at Station 150 shall occur monthly.

Preliminary Draft Permit part I.A.8.f(2) could be deleted.

Preliminary Draft Permit part I.A.8.f(3) shall read: "Conductivity and temperature shall be monitored concurrently with TDS at Stations 150, 151 and 160".

Preliminary Draft Permit part I.A.8.g, I.A.8.h, I.A.8.i and Preliminary Draft Permit part I.A.8.k shall replace Station 10 with Station 151.

Rationale: In accordance with State Regulations 18 AAC 70.245, the Department has authority to ensure that existing uses of the waterbody outside the mixing zone are maintained and fully protected. The specified monitoring will provide evidence to the Department that the effluent treatment and mixing zone size are adequate to protect all existing uses in the receiving water. The Preliminary Draft Permit required more monitoring than is required to reasonably demonstrate compliance with the Water Quality Standards (18 AAC 70).

In accordance with State Regulations 18 AAC 15.090, the Department may attach terms and conditions to a permit, variance, or approval, including operating, monitoring, inspection, sampling, access to records and reporting requirements, and the posting of a performance bond or other surety, that it considers necessary to ensure that all applicable criteria will be met.

In accordance with Federal Regulation 40 CFR 124.53(e)(3) the Department shall include a statement of the extent to which each condition of the draft permit may be made less stringent without violating the requirements of State law. These statements are included above where it states that a change to the Preliminary Draft Permit "could" be made.

7. Preliminary Draft Permit part I.D - Ambient Monitoring Requirements – may be updated as follows:

I.D.1 – delete reference to Stations 2, 9, 20 and Tributaries. Replace Station 73 with Station 160. Replace Station 10 with 151.

I.D.2 – delete reference to Station 2 and replace with Station 151.

I.D.6 – Ambient monitoring results from Stations 151 and 160 shall be submitted to EPA, ADEC and OHMP with the monthly DMR. Other required ambient monitoring results could be submitted in the Annual Water Monitoring Summary Report required in section II.J (see condition #10 of this certification).

I.D.7 – Table 5 – Ambient Monitoring Requirements: reference to Stations 2, 9, 20 and Tributaries could be deleted. Station 73 shall be replaced with Station 160. Station 10 shall be replaced with 151.

I.D.8 – References to streamflow measurements at Stations 2, 8, 9, 10, 12 and 140 could be deleted. Streamflow shall be monitored at Stations 151 and 160 as required to perform the calculations in I.A.8.i. Streamflow results from Stations 151 and 160 shall be submitted in the Annual Water Monitoring Summary Report required in section II.J (see condition #10 of this certification).

Rationale: In accordance with State Regulations 18 AAC 70.245, the Department has authority to ensure that existing uses of the waterbody outside the mixing zone are maintained and fully protected. The specified monitoring will provide evidence to the Department that the effluent treatment and mixing zone size are adequate to protect all existing uses in the receiving water. The Preliminary Draft Permit required more monitoring than is required to reasonably demonstrate compliance with the Water Quality Standards (18 AAC 70). Some of the Ambient Monitoring Program contained in

the current NPDES permit and not required by this certification will be required in the Monitoring Plan associated with the Waste Management Permit issued by ADEC for the management of tailings, waste rock and other wastes at the facility.

In accordance with State Regulations 18 AAC 15.090, the Department may attach terms and conditions to a permit, variance, or approval, including operating, monitoring, inspection, sampling, access to records and reporting requirements, and the posting of a performance bond or other surety, that it considers necessary to ensure that all applicable criteria will be met.

In accordance with Federal Regulation 40 CFR 124.53(e)(3) the Department shall include a statement of the extent to which each condition of the draft permit may be made less stringent without violating the requirements of State law. These statements are included above where it states that a change to the Preliminary Draft Permit "could" be made.

8. Preliminary Draft Permit part I.F – Bioassessment Program Requirements shall be updated as follows:

I.F.1 could be deleted as it is duplicative of I.F.2.

I.F.2 shall be updated as follows:

Bioassessment conditions required by the Alaska Department of Environmental Conservation Certificate of Reasonable Assurance: Within 60 days of the effective date of the permit, the permittee shall submit for review and approval to ADEC and OHMP, an updated version of the Biomonitoring Plan - ADF&G Methods for Aquatic Life Monitoring to Satisfy requirements under 1998 NPDES Permit - submitted by Cominco Alaska Inc. 1998, which was designed to detect possible aquatic community changes related to the mine effluent as follows:

Upon approval, the permittee shall implement the plan annually.

I.F.2 –Table 6 could be updated as follows:

TABLE 6 – Bioassessment Sites	
Sample Site	Factors Measured
North Fork Red Dog Creek	Periphyton (as chlorophyll-a concentrations) Aquatic invertebrates: taxonomic richness and abundance Fish presence and use
Main Stem Red Dog Creek	Periphyton (as chlorophyll-a concentrations) Aquatic invertebrates: taxonomic richness and abundance Fish presence and use
Ikalukrok Creek	Periphyton (as chlorophyll-a concentrations) Aquatic invertebrates: taxonomic richness and abundance Fish presence and use

Rationale: In accordance with State Regulations 18 AAC 70.245, the Department has authority to ensure that existing uses of the waterbody outside the mixing zone are maintained and fully protected. The specified monitoring will provide evidence to the Department that the effluent treatment and mixing zone size are adequate to protect all existing uses in the receiving water. The Preliminary Draft Permit required more monitoring than is required to reasonably demonstrate compliance with the Water Quality Standards (18 AAC 70). The remaining biomonitoring program contained in the current NPDES permit will be required in the Monitoring Plan associated with the Waste Management Permit issued by ADEC for the management of tailings, waste rock and other wastes at the facility.

In accordance with State Regulations 18 AAC 15.090, the Department may attach terms and conditions to a permit, variance, or approval, including operating, monitoring, inspection, sampling, access to records and reporting requirements, and the posting of a performance bond or other surety, that it considers necessary to ensure that all applicable criteria will be met.

In accordance with Federal Regulation 40 CFR 124.53(e)(3) the Department shall include a statement of the extent to which each condition of the draft permit may be made less stringent without violating the requirements of State law. These statements are included above where it states that a change to the Preliminary Draft Permit "could" be made.

9. Preliminary Draft Permit parts I.A.1, I.D.7 and I.G – Whole Effluent Toxicity (WET)

This certification does not require effluent limits for WET as contained in I.A.1 – Table 1 and these effluent limits could be removed. Monthly WET monitoring of the effluent is required by this certification. WET monitoring of the effluent shall be conducted on the fathead minnow, *Pimephales promelas* (larval survival and growth test) and on the water flea, *Ceriodaphnia dubia* (survival and reproduction test).

WET monitoring at Stations 9 and 12 is not required in this certification and could be removed in the Final Permit.

Rationale: The Department believes that there is no reasonable potential for the effluent to exceed the pre-mining natural toxicity of Red Dog Creek. The methodology used in the 1998 NPDES Permit to estimate natural toxicity in Red Dog Creek by assigning a WET value contained numerous assumptions and uncertainties that cannot be confirmed. While the pre-mining toxicity cannot be quantitatively confirmed, the Department believes that the effluent is less toxic than the natural condition of Red Dog Creek. Comparisons of water quality data for metals concentrations indicate that the discharge is less toxic than the natural condition in Red Dog Creek. The following paragraph is from this Department's 401 certification of the NPDES Permit that is currently in effect, which was issued in 1998:

"Finally, given all the uncertainties that surround not only our estimate of the natural toxicity in the Red Dog system, but also in the precision of WET testing itself, it makes sense to take advantage of the comprehensive biological monitoring that is occurring in those waters. Ultimately, direct observation and sampling of aquatic life in the system is more meaningful than laboratory WET testing. For that reason, we are strengthening the monitoring program that is already occurring. The new monitoring plan is included on p.2 of the revised draft certification. It may be that

when this draft permit is reissued in five years, we will have enough confidence in our biological monitoring that we can dispense with WET limits altogether."

Additionally, the 1998 401 certification discussed the applicability, at the point of discharge, of the regulations found at 18 AAC 70.020(b)(11)(C) and 18 AAC 70.030 regulating discharge of toxicity. The 1998 401 certification stated that since aquatic life is not a designated use at the point of discharge these regulations do not apply. Further, the Department's 1998 certification discussed that the effluent from the Red Dog Mine has less toxicity than the receiving water, which is clearly not contemplated under 18 AAC 70.020(b)(11)(C) and 18 AAC 70.030. The Department's position remains as stated in the 1998 401 certification: that 18 AAC 70.020(b)(11)(C) and 18 AAC 70.030 do not apply at the point of discharge and that the biomonitoring program is ultimately more meaningful than WET testing.

Aquatic biomonitoring at the Red Dog Mine began in 1990 and has continued annually since then. In 1999, an expanded biological monitoring program was initiated as a requirement of the NPDES Permit and the ADEC certification. The biological monitoring program (water quality, periphyton, aquatic invertebrates, and fish) has continued each year. Annual technical reports summarizing biomonitoring have been reviewed, and while changes have been observed, there have been no observed negative effects to the ecosystems of Red Dog and Ikalukrok Creeks resulting from the effluent or mine related activities affecting Red Dog Creek. The Department is requiring that the biomonitoring program in the 401 certification be at stations necessary to ensure that potential effects from the discharge are monitored (see condition # 8 of this certification). The remaining biomonitoring program will be contained in the Monitoring Plan associated with the Waste Management Permit issued by ADEC for the management of tailings, waste rock and other wastes at the facility.

Although ADEC finds there is not a reasonable potential for the toxicity of the effluent to exceed the toxicity of the receiving water in its natural condition, to provide additional assurance that the existing uses in Red Dog Creek are being protected, ADEC is continuing the comprehensive biomonitoring program. ADEC is also requiring monthly WET testing of the effluent to serve as an indicator of potential changes in the discharge over time, changes which might take longer to detect using field observations.

In accordance with Federal Regulation 40 CFR 124.53(e)(3) the Department shall include a statement of the extent to which each condition of the draft permit may be made less stringent without violating the requirements of State law. These statements are included above where it states that a change to the Preliminary Draft Permit "could" be made.

10. The following Permit part, II.J - Annual Water Monitoring Summary Report, shall be added to the Permit:

All monitoring results for a year must be included in an Annual Water Monitoring Summary Report and submitted by March 1 of the following year. The report must include a presentation of the analytical results and an evaluation of the results of monitoring required in Permit parts I.A, I.B, I.C, I.D, I.E, I.F and I.G. The evaluation must include an electronic spreadsheet containing monitoring data from the previous five years, a graphical presentation of the data at each monitoring station, a comparison of upstream and downstream monitoring results (to show any differences) and a comparison of monitoring results for each station over

time (to show any trends). The Annual Water Monitoring Summary Report may reference the monthly reports for QA/QC information.

All monitoring results for a calendar year shall be reported in the Annual Water Monitoring Summary Report. At a minimum, the report must include the following:

- a. Dates of sample collection and analyses.
- b. Results of sample analysis.
- c. Relevant quality assurance/quality control (QA/QC) information.

Rationale: In accordance with State Regulations 18 AAC 70.245, the Department has authority to ensure that existing uses of the waterbody outside the mixing zone are maintained and fully protected. The specified monitoring will provide evidence to the Department that the effluent treatment and mixing zone size are adequate to protect all existing uses in the receiving water.

In accordance with State Regulations 18 AAC 15.090, the Department may attach terms and conditions to a permit, variance, or approval, including operating, monitoring, inspection, sampling, access to records and reporting requirements, and the posting of a performance bond or other surety, that it considers necessary to ensure that all applicable criteria will be met.

January 20, 2006

Date

DRAFT

Gretchen Keiser
Program Manager
Wastewater Discharge Program

APPENDIX A CADMIUM NATURAL CONDITION BASED SITE SPECIFIC CRITERION

Introduction

The Red Dog Mine is a lead/zinc mine located near the Arctic Circle. It is in the foothills of the De Long Mountains of northwest Alaska, approximately 100 miles northwest of Kotzebue and 52 miles from the Chukchi Sea coastline. It is a remotely located facility accessible only by ship or chartered airplane. There are no other industrial facilities in the area. The nearest village is Kivalina, population 300, located at the mouth of the Wulik River on a barrier beach on the Chukchi Sea.

The Red Dog ore deposit is in the form of metal (zinc, lead) sulfides in a Mississippian shale formation lying on and within a ridge between the Middle Fork Red Dog Creek and South Fork Red Dog Creek (see Attachments A-1 and A-2).

The mill site lies to the west of the ore deposit and above the tailings impoundment. The tailings impoundment is formed by a dam across the South Fork of Red Dog Creek. Baseline data collection occurred from 1981 through 1987. Removal of overburden from the ore deposit and construction of

the tailings dam began in 1987. The first ore was delivered to the mill late in 1989, and the first concentrates were produced in December 1989.

Request for Site Specific Criterion

TeckCominco Alaska, Inc., the operator of the Red Dog Mine has requested that the Department of Environmental Conservation (ADEC) grant relief from the existing chronic aquatic life criterion for cadmium. They have requested a site-specific criterion based on the natural condition of the Main Stem Red Creek from the confluence of North Fork Red Dog Creek to the confluence with Ikalukrok Creek; and in Ikalukrok Creek from its confluence with Main Stem Red Dog Creek to its confluence with Dudd Creek. These are the stream segments where it has been documented that the natural background cadmium levels exceed the Alaska chronic aquatic life criterion.

Regulatory Requirements

Federal regulations at 40 CFR 122.44 (d)(1)(iv) and (v) require an effluent limit for cadmium to be incorporated into a National Pollutant Discharge Elimination System (NPDES) permit when a discharge has the reasonable potential to cause or contribute to an in-stream excursion above a numeric or narrative criterion within an applicable state water quality standard.

Alaska water quality standards (WQS) regulations allow for the development of a site-specific criterion (SSC), see 18 AAC 70.235. More specifically, Alaska WQS contain a provision that allows the development of a SSC based on the natural condition of a water body. Under 18 AAC 70.235(b), "If the department finds that a natural condition of a water body has been demonstrated to be of lower quality than a water quality criterion set out in 18 AAC 70.020(b), the natural condition constitutes the applicable water quality criterion." Natural condition is defined, by the State, as any physical, chemical, biological, or radiological condition existing in a waterbody before any human-caused influence on, discharge to, or addition of material to, the waterbody [18 AAC 70.990(41)].

Applicable Water Quality Standards

Alaska's WQS are composed of use classifications and numeric and/or narrative water quality criteria. The first part of a Alaska's water quality standard is a classification system for water bodies based on the expected designated uses of those water bodies. The second part of a state's water quality standards is the water quality criteria deemed necessary to support the designated use classification of each water body. These criteria may be numeric or narrative.

I. Designated Uses

The State of Alaska water quality standards protect Main Stem Red Dog Creek, and Ikalukrok Creek below Red Dog Creek for the following designated uses:

- Industrial water supply;
- contact recreation, wading only;
- secondary recreation, and;
- growth and propagation of fish, shellfish, other aquatic life, and wildlife

As specified in 18 AAC 70.230(e)(8) and 18 AAC 70.230(e)(18) the following designated uses have been removed from Main Stem Red Dog Creek, and Ikalukrok Creek below Red Dog Creek: